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Goddard Space Flight Center
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Subject: Type I Report for the reporting period 30 June 1972 to 31 August 1972.

Title: Geologic and Mineral and Water Resources Investigations in Western Colorado (Proposal 026)

(GSFC Principal Investigator Identification No. UN209)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Prior to, and since the initiation of our NASA Contract (NAS5-21778) 30 June 1972, the Colorado School of Mines has been actively preparing to acquire, analyze, and apply ERTS-A data in the field of geology and earth resources. The primary objectives of the Colorado School of Mines ERTS-A program are:

1. To assess the value of ERTS-A data for geologic, geomorphic, and mineral and water resources investigations and to identify the best methods for analysis and interpretation of ERTS-A data for geologic investigations.
2. To add to the knowledge of the geology of western Colorado, especially the Colorado Mineral Belt, by studying the following topics through interpretation of ERTS-A data:
   a) Distribution of major structural features
   b) Structural evolution
   c) Geomorphic evolution
   d) Relationship of mineral deposits to structural and igneous features.
3. To investigate the effects of the atmosphere and atmospheric variation on the ERTS-A data, and to correlate measurements of atmospheric parameters with specific ERTS-A images as an aid to the

proper processing, analysis, and interpretation of ERTS-A imagery.

During the report period, detailed and reconnaissance geologic field mapping was carried-out in several primary test areas in preparation for receipt of the first ERTS-A aircraft support and satellite data. Some of the ground studies utilized remote sensor data acquired previously for the Colorado School of Mines Bonanza Project (NASA Grant NGL 006-015-0001) by NASA remote sensor aircraft. Atmospheric and rock-soil reflectance measurements were made in several areas to establish representative sites and collect preliminary atmospheric data. Previous geologic mapping in western Colorado, particularly in the Canon City, Salida-Leadville, and central San Juan Mountains areas, is being compiled at a scale of 1:100,000 to provide regional geologic ground control for geologic analysis, interpretation, and evaluation of subsequent ERTS-A data. ERTS-A data will be used to update and modify these maps and to geologically map previously unmapped areas. A flight request for a low-altitude aircraft support mission (Mx213) was prepared during the report period, and detailed plans for ground support during the mission were scheduled.

To date, progress of the CSM ERTS-A program has proceeded on schedule; individual investigators are ready to analyze, interpret, and evaluate ERTS-A data. Several investigators have, however, been forced to alter their plans somewhat because high-altitude photographic data obtained during Mission 205 in June 1972 (and make-up Mx208 in July) have not yet been received at the Colorado School of Mines (CSM). This delay, although bothersome, has not altered the capability of the investigators to proceed with their preparation.

During the next reporting period, ERTS-A data (aircraft and satellite) will be studied and interpreted from the point of view of the program objectives stated above. Comprehensive ground support will be provided during Mx213 (September) and the data collected during the mission will be correlated with ERTS-A data during data interpretation. As a result of data analysis, the existing CSM Data Analysis Plan will be appropriately modified to reflect the type, quality and quantity of ERTS-A data realized.

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